COncise adVice on Inpatient Diabetes (COVID:Diabetes):

GUIDANCE FOR MANAGING INPATIENT HYPERGLYCAEMIA

DIABETES UK
KNOW DIABETES. FIGHT DIABETES.

JBDS Joint British Diabetes Societies for Inpatient care

ABCD

NATIONAL INPATIENT DIABETES COVID-19 RESPONSE GROUP*

Use when:

- ✔ **Glucose above 12 mmol/l and a correction dose is appropriate for the individual patient**
- ✔ **DKA/HHS not present**

Can be used in place of variable rate intravenous insulin when infusion pumps not available

- ⚠ **DO NOT use for people with COVID-19 causing severe insulin resistance in the ICU. Contact your local diabetes team for advice in this circumstance.**
- ⚠ **After 9pm consider risk of hypoglycaemia overnight when thinking about the use of a corrective dose**

IF GLUCOSE > 12 MMOL/L AND NO INSULIN ADMINISTERED IN PREVIOUS 4 HRS CONSIDER A CORRECTIVE DOSE OF RAPID-ACTING ANALOGUE INSULIN (NOVORAPID®/HUMALOG®/APIDRA®)

- Re-check glucose after 4 hours OR before next meal - further action may be required
- Target glucose 6-10 mmol/l – aiming for higher end of range (up to 12 mmol/l acceptable)
- Dose decided using one of the following 3 factors and the table below. Factors are listed in order of importance:
  1. If person uses pre-existing correction ratio **(CR)** (e.g. 1 unit insulin lowers glucose by 3 mmol/l) this should be used
  2. If person using insulin but doesn't have correction ratio, use their usual total daily insulin dose **(TDD)**
  3. If person not previously using insulin, or dose is unknown, use their **weight**
- If the person has rapid-acting insulin with each meal the corrective dose can be added to their mealtime dose if appropriate.

GLUCOSE (MMOL/L)	CR* = 1UNIT ↓ 4 MMOL/L OR TDD** LESS THAN 50 UNITS OR WEIGHT LESS THAN 50KG	CR* = 1UNIT ↓ 3 MMOL/L OR TDD** = 50-100 UNITS OR WEIGHT BETWEEN 50-100 KG	CR* = 1UNIT ↓ 2 MMOL/L OR TDD** OVER 100 UNITS OR WEIGHT OVER 100 KG
12.0-14.9	1	1	2
15.0-16.9	2	2	3
17.0-18.9	2	3	4
19.0-20.9	3	3	5
21.0-22.9	3	4	6
23.0-24.9	4	5	7
25.0-27.0	4	5	8
Over 27	5	6	9

***CR** = Correction ratio, ****TDD** = total daily insulin dose

⚠ **It is recommended that glucose is checked at least 4 times per day in people treated with insulin**

LONG-ACTING INSULIN (LEVEMIR®/ ABASAGLAR®/LANTUS®/SEMGLEE®/ HUMULIN I®/ INSULATARD®/INSUMAN BASAL®)

- **Already using long-acting insulin:** Continue and titrate dose (see tables below)
- **NOT already using long-acting insulin:** If 2 or more glucose readings in 24 hrs are > 12 mmol/l (eg, 2 or more corrective doses in previous 24 hrs)
  - ADD long-acting insulin - total dose 0.25 units/kg/day (eg, 0.25 x 80kg = 20 units OD **OR** 10 units BD depending on the choice of basal insulin - see below).
  - NOTE if:
    - Older (>70 yrs) or frail
    - Serum creatinine >175 umol/l

    Use a reduced long-acting insulin dose of 0.15 units/kg (eg 0.15 x 80kg = 12 units OD **OR** 6 units BD)

Recommended options (all acceptable – refer to local protocols):

Levemir® Insulin detemir 100 units/ml (U100)	› Two equal doses of 0.125 units/kg, 12 hrs apart › Not available in vials so insulin pen needles must be available to use with a pen device* › Can adjust either dose
Abasaglar®/Lantus®/Semglee® Insulin glargine 100 units/ml (U100)	› Single dose of 0.25 units/kg/24 hrs (minimises patient contact) or › Split above into 2 equal doses, 12 hrs apart › Abasaglar®/Semglee® not available in vials so insulin pen needles must be available to use with an insulin pen device**
Humulin I®/Insulatard®/Insuman Basal® Isophane insulin 100 units/ml (U100)	› Two equal doses of 0.125 units/kg/10-14 hrs apart › Particularly suited to steroid treatment – dose given as ⅔ total long-acting insulin dose am :⅓ total long-acting insulin dose pm

* Only specific insulin syringes/needles should be used to administer insulin from vials

** DO NOT WITHDRAW INSULIN FROM A 3ML INSULIN PEN CARTRIDGE OR 3ML PREFILLED PEN

DOSE ADJUSTMENT FOR LONG-ACTING INSULIN

Doses can be titrated daily, although longer-acting insulins may take 48-72 hours to reach steady state. Dose adjustments will affect blood glucose throughout the day.

ONCE daily long-acting insulin

GLUCOSE LEVEL JUST BEFORE INSULIN DOSE	
<4mmol/L	Reduce insulin by 20%
4.1-6mmol/L	Reduce insulin by 10%
6.1-12mmol/L	No change
12.1-18mmol/L	Increase insulin by 10%
>18mmol/L	Increase insulin by 20%

TWICE daily long-acting insulin

GLUCOSE LEVEL	JUST BEFORE MORNING INSULIN DOSE	JUST BEFORE EVENING INSULIN DOSE
<4mmol/L	Reduce **evening** insulin by 20%	Reduce **morning** insulin by 20%
4.1-6mmol/L	Reduce **evening** insulin by 10%	Reduce **morning** insulin by 10%
6.1-12mmol/L	No change	No change
12.1-18mmol/L	Increase **evening** insulin 10%	Increase **morning** insulin by 10%
>18mmol/L	Increase **evening** insulin by 20%	Increase **morning** insulin by 20%

Dose reduction should also be considered in the following circumstances:

- **Improving infection (as measured by falling CRP)**
- **Enteral feed reducing or stopping**
- **Corticosteroid treatment reducing or stopping**
- **End of life care**

In people recovering from COVID-19-related insulin resistance, doses may need to be reduced RAPIDLY to avoid hypoglycaemia.

As noted above, severe insulin resistance has been noted in some people with COVID-19 in the ICU. In this circumstance, suggested alternative treatment strategies include four times daily doses of Levemir ® or twice daily doses of Lantus ®.

Contact your local diabetes team for advice.

***NATIONAL INPATIENT DIABETES COVID-19 RESPONSE GROUP:**

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